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Review Paper on Composite Leading Index Creation for Forecasting the Bangladeshi Financial Sector

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Abstract

In perspective of the economic vulnerability faced by banks in financial sector, this study mirrors the methodology used by Shumway (2001) – the dynamic hazard model that is able to forecast systemic risk in financial market arena. Here, the terminology followed is based on the CAMELS framework variables: capital adequacy, asset, management, earnings, liquidity and sensitivity to market risk. The objective of this study is to construct a macroprudential indicator (MPI) for the case of Bangladeshi financial market. The result will then be tested for robustness with macro-stress test. Lagged independent variables will be used in the simple hazard model to allow early prediction of MPI in the year in which the crisis happens. The empirical findings can be used as a guideline for the Bangladesh Government and policy makers in accessing, examining and forecasting the health of the Bangladeshi financial system and formulate suitable financial system policies for control. MPI generates information about systemic risk allowing the detection of potential economic crises functioning as an early warning indicator. Government and policy makers will be able to make early preparation in cushioning any potential crises by means of the MPI. Thus the impact of the crises could be minimized and eventually reduce its impact on the Bangladesh economy. The specific objectives are to assemble a novel MPI that is able to recommend early signals of financial market vulnerability, to identify the MPI turning points and establish a comprehensive reference chronology for Bangladeshi financial market and to evaluate the predictive performance of newly constructed MPI on characterizing Bangladeshi financial sector.

Keywords: Macro-prudential Cycle; Shumway Method; Dynamic Hazard Model; Financial Sector; Economic Crises

JEL Classifications: C53; G01; G17

Introduction

The incidence of the financial and economic crises worldwide during the past two decades has arisen concerns regarding the stability of financial system of an aggregate economy and its interdependence in accordance with other sectors of the economy. Earlier the central banks as well as banking supervisors put significant emphasis on the risk for solvency and liquidity in perspective of individual banks rather than the banking system as a whole. Over the years majority of focus has shifted from the micro-prudential to macro-prudential dilemma of financial stability - generally signalled by the absence of extravagant volatility, crises or stress in the financial system. Especially following the worldwide financial crises during 2008-09, monitoring as well as ensuring financial system stability now has become significantly an overarching objective of the central banks all over the world. According to the European Central Bank (2007) financial stability could be categorised as a condition in which the financial system - comprising the financial intermediaries, markets as well as market infrastructure - is capable of withstanding the shocks along with the unraveling of the financial imbalances, thereby mitigating significantly the likelihood of the disruptions in financial intermediation process which are more severe enough impair allocation of the savings particularly to profit-making investment opportunities.

Although there has been observed no consensus on defining as well as measuring the financial stability, a numerous number of the central banks around the entire world have started for assessing the risks towards financial stability through approaching to various indicators and constructing indexes that are a part of their periodic financial stability reports (FSRs). Constructing a composite as well as aggregate measure of financial system stability by means of some kind of index has begun gaining recognition as a part of the early warning indicators for the assessment of the vulnerability of the financial system. The International Monetary Fund (IMF) regularly publishes "Global Financial Stability Report" reviewing the strengths as well as weaknesses in world financial system on the basis of a range of indicators and indexes. Bangladesh Bank, like many other central banks around the world, also has been publishing the financial stability report integrating some financial system sort of indicators and stress testing which could signal strength and the vulnerability of financial system. While individual variables as well as indicators are beneficial in analysing overallly the strengths as well as weaknesses of the financial system, various research studies have attempted towards development of composite indicators that could create convenience for the Government and policy makers for triggering significant action on the basis of early signals of vulnerability. Some central banks together with South Asian central banks such as the Reserve Bank of India as well as the Central Bank of Sri Lanka also have been initiated publishing periodic reports on the financial stability that also initiate an aggregate index, comprising some sub-indices, indicating the measure of soundness of the banking as well as financial system. While there is no globally accepted single measure or index for the assessment of financial system soundness, central banks adopt a variety of methodologies for the construction of their own financial stability indexes on the basis of their financial and economic conditions, availability of the data as well as perceived risk of the vulnerability. In this backdrop, it may be a ideal idea to construct a composite/aggregate financial stability index for the financial system of Bangladesh on an experimental basis based on the proposed Shumway (2001) methodology.

Macroprudential analysis (MPA) is a combination of microprudential indicator and macroeconomic variables to analyse the financial system of a country regarding the health and its stability. It is derived from microprudential indicator which initially only takes accounts on the aggregate financial institution on their well-being started in the late 1970s (Clement, 2010). Clement (2010) stated that MPA starts driving attention from public in the 1980s and being implemented to supervise the financial system with the inclusion of macroeconomic variables. MPA was found to be helpful, providing better supervision for the financial system as it was able to detect the upcoming crisis that would hit Bangladesh. However, many variables are needed to be taken into account and it involved complicated calculation. Most of the researchers came up with the macro-prudential tools such as the Counter-Cyclical Capital Buffer (CCyB) and liquidity model or known as MPI to improve MPA into a much simpler calculation. MPA has few components and the main component, Financial Soundness Indicators (FSIs) could represent MPA thoroughly.

Here it is proposed in this study is to construct a unique index which is the MPI for the Bangladesh financial market based on Shumway (2001) methodology. MPI consists of CAMELS (capital adequacy, asset quality, management, earnings, liquidity, and sensitivity to market risk) frameworks that are the basic to all the accountability of MPA (Selialia, Mbeleki and Matlapeng, 2009). CAMELS frameworks that will be used in MPI enable prediction for systemic risks. The access of systemic risk will enable MPI to have the ability in detecting future financial crisis. In conjunction with the ability of crisis detection, MPI will also act as an Early Warning System (EWS). This MPI will perform as an index to cushion any probable risk by forecasting

Bangladeshi financial market sector's volatility at contingency moments. This reflects that MPI has similar functions to MPA. Therefore, MPI is essential to be carried out in order to measure financial health and stability in Bangladesh.

Literature Review

MPI is a statistical measurement used for monitoring the financial health and soundness of a country's financial sector, corporate bodies and household counterparts (Bhattacharyay, 2003; Moorhouse, 2004; Clement, 2010). In the literature of Moorhouse (2004), it stated that the MPIs are experimental indicators in which its development is being coordinated by the International Monetary Fund (IMF) with the support of other international organizations such as World Bank, the Bank for International Settlements, the Organization for Economic Cooperation and Development (OECD), the European Central Bank (ECB) and all IMF member countries in all geographical areas. Bangladesh that has confronted two big crashes in 1996 and in 2010. People with little knowledge and people without any knowledge entered into the market to make profit. Around 3.3 million people were affected by the market crash 2010 (Choudhury, 2013). With the severe deepening of the ongoing financial crisis, most countries have observed their exports significantly go down. China's declined by 17 percent in January 2009, those of Singapore by 44 percent. Compared with numerous other countries, Bangladesh's performance of export, if the first few duration of months of the recent fiscal year are considered, has been quite remarkable – growth during first con-current seven months of FY2008/09 (July-January). Two significant contributors, knit and woven was a robust 18.2 percent (only 0.45 percent lower comparing to the target). Readymade garments (RMG), maintained some impressive figures, of 26.2 percent and 20.6 percent growth, respectively (these growth figures were 14.3 percent and 4.2 percent, respectively, for July-January of FY2007/08). Export of the apparels, which contributes about proportion of three-fourths of aggregate export earnings, is still holding. Demand for low-end products that registered overall growth during the first seven months (to a particularly significant extent, thanks to the US market that is called 'Wal-Mart effect') in keeping with the trend growth rates. Imports by the US during the duration of last quarter (October-December) of 2008 (which represents the most US imports from China as well as Sri Lanka affected quarter of the year arisen from economic shock) declined by 8.8 percent. Sri Lanka stimulated only marginally, whereas imports from India as well as Cambodia experienced comparatively negative growth (over the last quarter of previous year). However, imports from Bangladesh and Vietnam impressively increased, by 18.1percent (compared with negative growth of 3.4 percent in the same period of fiscal year 2007) and 20.1 percent, respectively, mostly on account of the higher imports of the lower-end apparels (Rahman, Bhattacharya, Iqbal, Islam, and Kumar, 2009).

Shumway (2001) estimated models with several sets of independent variables. The forecasting models incorporated Altman's (1968) and Zmijewski's (1984) independent variables, and some new market-driven independent variables. Altman's variables were described massively in Altman (1993). They include the measuring ratios of the working capital to total assets (WC/TA), retained earnings to TA (RE/TA), earnings before interest as well as taxes to TA (EBIT/TA), market equity towards total liabilities (ME/TL), and sales to TA (S/TA). In order to make the forecasting practice realistic, researcher lagged all data towards ensuring that the data were observable in the starting of the year in which the bankruptcy is observed. Towards construction of Altman's (and Zmijewski's) variables, there was lagged COMPUSTAT data for ensuring that each and every fiscal year ends at least six months before the beginning of the year of interest. Author lagged the overall market-driven variables to signal market failure by trending a similar fashion in his research.

The ECB methodology is found to be using macroprudential indicators (MPIs) in its estimation, and it is different from the methodology used by IMF which uses FSIs in estimating the financial stability (Mörtinen, Poloni, Sandars, & Yesala, 2005). ECB highlights that the MPIs and FSIs approaches are very distinct in conducting MPA (Mörtinen et. al, 2005; Agresti, Baudino & Poloni, 2008). Nevertheless, these approaches had similar objectives - producing an MPA that tests systemic risk to sense any possible economic shock and create quantitate benchmark for financial sector (Agresti et.al, 2008). In short, both indicators (MPIs and FSIs) are used in very distinct methods but with similar objectives.

Besides the IMF, some researchers also attempted to develop an MPI tool based on their country's preferences but with different approaches in the sense that IMF used the elements in the CAMELS framework to estimate the MPI, while those researchers used other frameworks such as liquidity ratios and CCyB as a proxy to measure MPI. For instance, the study of Reserve Bank of New Zealand (2013) used CCyB as a proxy for MPI. However, the study of SverigesRiskbank (2012) found out that CCyB is not good proxy for MPI because it does not discriminate between the sources of risk but rather focuses on the consequences of risks. Drawing on supervisory, market-based and macroeconomic data for the period from 2000 to 2012

based on Austria perspective, previous research (Eidenberger, Neudorfer, Sigmund & Stein, 2013) examined various indicators regarding their predictive power for this stress index. Their results indicate that risk channels, excessive growth, interconnectedness and mispricing of risk have the greatest influence on the Austria Financial Stability Index (AFSI).

Altman (1993) demonstrated the discriminant analysis (DA) calculations obtain either the last data outlined (at least six months) before the bankruptcy or last data been available during 1983 for each and every firm in the sample. Forecasts on the basis of this function are differentiated to hazard model predictions formed with the data available in 1983. A new set of the coefficients calculated by couple of researchers: Begley, Ming, and Watts (1996) and two functions calculated with the obtained bankruptcy data by Altman (1993). The coefficients selected for the timeline of 1962-1983 data were calculated. Those data consist of 1822 firms that have complete data for minimum one year between the timeline of 1962 and 1983, 118 of which consequently led for the bankruptcy within 1983.

The causes of the instability in regard of the financial system, surveyed concisely so far, highlight the major need for significant measures to be taken for the reduction of potential for the financial instability (Hawkesby, 1998). There are a number of countable measures that might be taken by the policy makers towards promoting financial stability, such as encouraging the strong market incentives, efficient corporate governance as well as sound infrastructure, maintaining an proper degree of supervision over banking system, reducing the occurrence of incidence of the moral hazard, and maintaining a sound and stable macroeconomic environment that response to current financial crises, international financial agencies already have utilised significant resources for identifying as well as understanding potential or probable leading indicators of financial instability. For example, as part of international effort for improvement of risk management practices and for better assessing financial sector vulnerabilities, the IMF and World Bank jointly commenced a pilot Financial Sector Assessment Program in fiscal year 1999.

There is an enormous support for idea that asset prices and the credit cycle possess strong implications for the systemic stability, and that there are limitations to what inflation- focused monetary policy can attain on its own (Blundell-Wignall and Roulet, 2014). White (2012) focuses on the recent monetary ease, which could have result as unintended consequences. Macro policy needs to lean a variety of resources into the wind and globally the governments should utilise whatever tools they have in current crisis to help retain macro equilibrium given the limitations to what central banks can do.

Individual MPIs (Macroprudential Indicators) can offer the general guide on the basis of past historical sort of experience of the indicator concerned, but the indicators are not utilised mechanically towards the implementation of macroprudential policy (Wolken, 2013). Risks can build up in financial system from the different sources as well as in many different possible ways. Consequently, judgement is significantly required for considering the case in regard of macro-prudential intervention, selecting the proper instrument towards the deploy, and for deciding when to withdraw any instrument. Nevertheless, robust as well as reliable indicators provide the basis for more better decision. Research paper by Hollo, Kremer and Duca (2012) introduces a contemporary indicator of contemporaneous stress in financial system named Composite Indicator of Systemic Stress (CISS). Its specific statistical sort of design is shaped according to the standard definitions of the systemic risk. The main methodological kind of innovation of the CISS is the application in accordance with basic financial portfolio theory.

Banks need mechanisms for monitoring positions and create incentives for the prudent risk-taking by numerous divisions and individuals (Pyle, 1997). Risk measurement deals with the quantification of risk exposures, whereas the risk management refers to overall process by which managers can satisfy these needs as well as follow to define a business strategy, to determine the risks to which it is been exposed, to quantify significantly those risks, and to understand as well as control the nature of risks it faces (Cumming and Beverly, 2001). Most of the countries' central stock markets have confronted taste of the collapse at least once. In 2000, London Stock Exchange and American Stock Exchange encountered this sort of collapse. Economic recession globally caused the share market severely get the situation of collapse in America and Europe. But Bangladesh protected itself from this situation due to very little foreign investment in this country. After 1996 collapse in sphere of the share market, a neutral Inspection Committee was formed in accordance with a view to investigating the reasons behind the market collapse. Munir Uddin, an FCA, was the chief of that committee (Choudhury, 2013) and he opined that this collapse of 1996 was the consequences of the activities of a categorised group of people. Some of the leading businessmen along with some foreigners committed that crime. As a whole, it can be said that paper based share certificate, manipulation, lack of knowledge of the retail investors, greed and inside trading are some of the major reasons of this collapse

(Ministry of Finance Bangladesh, 2011). After 14 years, SEC and the two share markets again experienced the taste of collapse. But this time the underlying reasons were different. The paper based share certificates currently are no more in existence. As per the report of Ibrahim Khaled dated on 26 January, 2011, various reasons led the consequences of this disaster. Institutional investors played a significant role in that case. The free entrance of the black money was the reason creating the collapse to happen in the share market. There it was emphasised the necessity of initiating a sound management system to recover this financial sector volatility.

Bangladesh is also affected by the worldwide financial crisis through the minimisation of remittances, ready-made garments, migration and agricultural exports (World Food Program, 2010). The economy is extremely dependent on migrants' earnings in the Gulf countries as well as Western countries. Bangladesh holds a significant position among the top remittance recipient countries in the world. The contribution of the remittances more than doubled from 4 percent in 2001 to 10 percent of GDP in 2008. Exports take up 20 percent of the GDP. Exports of ready-made garments (RMG) represent 80 percent share of total exports. Almost half of the exports go to the Europe, while 25 percent goes to the United States. The volume of trade decelerated by 5.3 percent between July-December 2008 against an increase of 3.4 percent during the same period in 2007 a further decrease of 7.1 percent was observed in January 2009, compared to January 2008 (WFP, 2009). Export orders of RMG fell by 5 percent in January and 17.6 percent in February 2009, with lagged effects on the actual RMG exports expected 3-4 months later. Fish exports decreased by 16 percent on an average in July-December 2008 compared to July-December 2007. Jute exports also decreased by 17 percent over the same period and by 19.8 percent in January 2009 compared to January 2008. Migration decreased by 40 percent in January-March 2009 compared to the same period in 2008. Approximately 8,000 Bangladeshi workers residing abroad were deported in February 2009, a near doubling if compared to the previous fiscal year (WFP, 2009).

The levels of recent account deficits of Bangladesh were observed clustering around 1 percent of GDP toward the end of 1990s that became positive in 2001 (Islam, Islam, Siddiqui and Karim, 2014). The country's exports in regard of goods and services (to the GDP) increased by approximately 9 percent over 1990s, but it remained in the category of the low exporting countries. Though, capital account significantly appeared to be the major force in pulling up the foreign exchange reserve in numerous economies, the result or impact of increase in foreign direct investment (FDI) flows of Bangladesh's reserves has been limited. Bangladesh's foreign exchange reserve position improved during 1993-1996 however it worsened over the following years. In 1995, foreign exchange reserve was equivalent to about 8 months of imports that had fallen to around 2 months in 2000 (Bangladesh Bank, 2009).

The performance in regard of the Bangladeshi economy continues to bear several lagged negative effects in accordance with the global financial crisis. The deterioration of the trade performance were observed in the early 2009 is confirmed. The total value of exports as well as imports reduced, respectively by 6.2 percent and 3.6 percent, in July-December 2009. This deterioration contrasts with an increase of 19.4 percent and 22.4 percent, respectively, in July-December 2008. Exports of Knitwear as well as Woven garments (i.e., RMG) fell short of the performance of 2008 by 7.2 percent and 8.0 percent respectively during fiscal year July-December 2009 duration of period (WFP, 2010).

The GDP growth rate has shown disastrous negative trend which led to negative consequences in the long run. The current trade balance is deteriorating day by day in the recent fiscal years respectively. The FDI flow ratio in 2007 and 2011 is 793 & 775 in the account of million US dollar. The devaluation of taka exchange rate is occurred during the last few years in accordance with the periods. Bangladesh Bank (BB, 2009) earlier significantly reconfirmed GDP projections made in the national budget for fiscal year 2008/09 (6.5 percent growth), which was subsequently revised as downward (6.0 percent). The January 2009 policy statement in regard of the central bank (BB, 2009) mentions a high case of 6.6 percent and a low case of 6.3 percent. The World Bank (2008) has come up with a sort of two alternate scenarios: under the best case scenario, Bangladesh's GDP will grow by 5.4 percent; under the worst case scenario, GDP growth in percentage terms could come down to 4.8 percent (Rahman, Bhattacharya, Iqbal, Islam and Kumar, 2009).

My assumption is that my research could forecast for a vital prediction to the key factors of macroprudential indicators of the financial market of Bangladesh. That will stabilize at the key feasibility of the study. It will also lead to possible remedies in this context. The outcome of this study is a composite leading index known as MPI followed by Shumway (2001) method. It will be constructed from a set of subset indicators from FSIs by using the CAMELS framework. This means MPI in this study will have full coverage of every aspect on financial sector. However, the CAMELS framework's variables that will be selected in constructing MPI will

be specialized to Bangladesh's conditions. In-depth understandings about the financial sector in Bangladesh will be accessed. Thus, financial institution or non-financial institution will be able to have alternative guidelines in their organization operationalization.

Here it is proposed to construct the MPI which is used to predict the trend of the Bangladeshi financial system. In other words, this MPI would be able to forecast the Bangladeshi financial market's well-being. MPI is able to signal any possible economic shock that might create an impact towards Bangladeshi financial system. Government and policy makers will be able to make early preparation to cushion any potential crises with the help of MPI. Thus, the impact of the crises can be minimized on the Bangladeshi economy.

Furthermore, the constructed MPI in this study will be used as a benchmark for the purpose of supervising Bangladesh's financial health and stability. In this study, guidelines will be produced by using the constructed MPI for the use of the Bangladesh Government and policy makers in accessing the health of Bangladeshi financial system. MPI might be able to assist CCyB that is widely used recently in accordance to macroprudential policies in Bangladesh.

Methodology

This study mirrors the methodology used by Shumway (2001) – the dynamic hazard model that is able to predict or forecast systemic risk. The outcome will be then tested for the robustness in accordance with macro-stress test. Lagged independent variables might be used in terms of the simple hazard model to the endowment of early predicting of the MPI during year in which crisis happens. Parameter evaluates for the two hazard models that incorporates market-driven variables. In this research, it might be collected aggregate bankruptcy data from the reliable Bangladesh Bank data sources. There could also be explored for firms whose stock was delisted from the national stock exchanges. All firms that filed for any sort of bankruptcy within five years of the delisting are considered as bankrupt. The sample contains a numerous number of bankruptcies between 1998 and 2018. The variable of interest in regard of the hazard model is the firm age. In this paper, a firm's age is defined as number of calendar years it has been traded on the national stock exchanges. The dependent variable that are associated with these observations would be equivalent to zero, indicating that no occurrence of bankruptcy. Whereas, if the result outcome is not equal to zero, it indicates bankruptcy.

The model reported forecasts bankruptcies with market-driven variables exclusively while the model where tested later on market-driven variables with accounting ratios from Zmijewski's (1984) model. Because there is no evidence of duration dependence in bankruptcy probability, neither model contains the log of firm age as an explanatory variable. Both models will be estimated with all data from 1998 to 2018. An important advantage of the model that is based solely on market-driven variables. After the process of dynamic hazard model, multivariate methodology will also be adapted in this study into composite index.

There are two ways to determine more logical procedure for the index construction. One of the ways is forming the Principal Component Analysis (PCA) as the summary index and other is the regression modelling approach. The significant effectiveness of this PCA is to obtain a clear analysis of the each component displays in the index.

This paper assesses the hazard model for forecasting bankruptcy. The hazard model is theoretically more preferable to the previously used static models because it modifies for period during the occurrence of risk and allows for the time-varying covariates. It utilises all available aggregate information for producing the bankruptcy in regard of probability estimates for the all firms at each and every point in time. By utilising all the available data, it ignores the possible selection biases visible as inherent in static models. The hazard model is quite simple to estimate as well as interpret. A logit evaluation program can be utilised to calculate the maximum likelihood of estimates. Test statistics in regard of the hazard model could be derived from statistics outlined by means of logit program. The hazard model could be interpreted either like a logit model executed by firm-year or it could be viewed as the discrete simplified failure-time model.

Discussions

In the perspective of Bangladesh, as reflected in non-food inflation, the underlying inflationary pressures, continue on a downward trend in FY 2015 due to policy restraint. It is expected to be met predominantly with the rebound in domestic demand, from existing supply capacity. But this poses upside risks to inflation with the consequence of higher wages and an adjustment in administered prices. Export growth is likely to become moderate from improved labour rights and safety standards as the garment industry absorbs operational costs and higher wages and also because a process of modernisation is being undertaken by factories. It is expected to remain subdued in the case of remittance growth with the consequence that imports recover from stronger domestic demand, driving the current account to downgrade leading to a moderate deficit. In future years reserves are expected to accumulate further due to foreign-funded projects which are supported by a strong pipeline (IMF Country Report, 2014). The demand for credit in the economy has remained sluggish at a modest rate especially from the private sector. Credit to the government sector has grown but credit reduced to privately-owned organisations which led the banking system to excessive liquidity. Indeed, credit increased by over 60 percent in the level of liquidity in the years preceding the current period due to several factors: (a) Most importantly the underlying reason behind the absence of investments is the energy crisis in Bangladesh. (b) However, as the result of uncertainty and postponed investments, credit has led the private sector in the world market to downfall.

The major difficulty in implementing regulations with a view to fostering financial stability lies in the fact that there is both a micro and a macroeconomic dimension. Crockett (2000) stressed this aspect of financial stability, which focuses as much on the objectives to be reached as the perception of the economic mechanisms concerned. The macroeconomic objective is to reduce probability with regard to crises occurrence and to limit the corresponding costs, including those arising from moral hazard prompted by certain prudential measures (such as limiting systemic risk). In microeconomic terms, the prudential objective is to limit the probabilities of individual financial institutions or banks in terms of failure by limiting “idiosyncratic risk”. According to Crockett (2000), this would be tantamount to giving an equal weight to each institution, whereas the macro-prudential perspective would focus on overall performance and the correlations between institutions. He suggested that prudential regulation should be calibrated to take account of the systemic significance of institutions, stressing that the failure of an individual institution is not a problem in itself. If applied to stock markets, this would mean that the failure of an individual firm would not automatically trigger a stock market crisis. In other words, the regulator does not have to systematically bail out market participants in the event of a failure but adapts its attitude on a case-by-case basis. In the event of systemic risk, regulators must intervene in a corresponding manner.

In this context, the prudential regulation of financial markets must aim to reduce the asymmetry of information, prevent distortions of competition, try to reduce the pro-cyclicality of certain measures and not, in principle, limit the supply of financial products or services, which could affect the dynamics of innovation. Therefore, from a microeconomic perspective, the authorities must remain vigilant about hard behaviour on the part of market applicants and the use of financial leverage. This is one of the priorities of regulators which is to prevent different market players from excessive risk-taking. At the macroeconomic level, regulators should focus on the functioning and organisation of markets and exchanges.

Focusing on FDI in Bangladesh, it was reported at 1.73 percent of GDP in 2015, compiled from officially recognised sources according to the World Bank’s collection of development indicators. But, to put this into context, when related to infrastructure, in order to scale up investment substantially, Bangladesh’s investment rate is low compared to regional standards, as the result of the right investment conditions not being in place because of a number of bottlenecks. The current climate, however, has dampened investor confidence which has caused an acute energy crisis and most crucially created an uncertain world market (Ministry of Finance Bangladesh, 2016).

The empirical findings of this study can be used as a guideline for the Bangladesh government and policy makers in accessing, examining and forecasting the health of the Bangladeshi financial system and formulate suitable policies in controlling the Bangladesh financial system. This is because MPI generates information about systemic risk, which then allows the detection of potential economic crises. In other words, MPI will function as an early warning indicator. Government and policy makers are able to make early preparation in cushioning any potential crises with the help of MPI, so that the impact of the crises can be minimized and eventually reduce its impact on the Bangladesh economy. Hence, with MPI, the respective authorities can provide better supervision on the financial system as it is able to detect upcoming crisis that would hit Bangladesh. With the right planning for Bangladeshi economy, the citizens of Bangladesh are able to enjoy a higher standard of living since their cost of living will not be greatly affected by the crises.

Furthermore, MPI serves as a leading indicator to indicate the financial movements in Bangladesh which also acts as a benchmark for the financial market. Corporate bodies would be able to access the financial movement to ensure the trend is in a stable position before carrying out organizational activity such as trading. Trading is an activity which highly dependent on the financial market. In fact, Bangladesh is an export-oriented country that is very active in trading. Thus, information on financial market stability provides sufficient information to Bangladeshi trading partners which would encourage greater trust from them towards Bangladesh. This will stimulate the trading certainties and foster better impressions towards Bangladesh of other trading partners. Thus, Bangladesh would maintain stable trades or might even enjoy increments on the income derived from international trades which is the ultimate result from the availability of adequate information on Bangladeshi financial position. Likewise, this study also enables the accessibility for banking institution and non-banking institution on market condition in Bangladesh.

In addition, MPI will also benefit both current and potential investors who are interested in increasing or performing investments in Bangladesh. MPI reflects the current and potential ability of the Bangladeshi economy in terms of economic growth and also highlights potential risks that may arise. Also, MPI will provide most if not all, the necessary information to these current and potential investors regarding the current and future financial position of Bangladesh. Until then, these investors will decide whether to increase their investments in Bangladesh. In other words, information sufficiency reduces the uncertainty risk which eventually increases the confidence of investors towards the health of Bangladeshi financial market. Therefore, MPI provides sufficient information regarding the health of the Bangladeshi financial market which will ultimately increase the probability of investors to increase their funding in Bangladesh either at current and future investments. Increased funding from investors either currently or in the near future may have substantial positive effects on the Bangladesh economy.

Conclusion

Macroprudential indicator, also known as MPI, shows the health and stability of the Bangladeshi financial system. MPI contains CAMELS framework that will cover all the important elements that is relevant to the financial sector. MPI also functions as Early Warning System (EWS) - the ability to detect future financial crisis by forecasting systemic risk. Thus, MPI is needed in the Bangladeshi financial system in combating future crisis since they will cause significant negative impacts on Bangladeshi financial system. Hence, the construction of MPI is crucial in the Bangladeshi macroprudential policy-making.

More higher sensitivity financial market cycle modelling can be attained in the future through this Shumway (2001) methodology. In turn, such a model may provide detailed banking related information for policymakers and stakeholders in the financial market sector. Policymakers could utilise this information to create more efficient policies while stakeholders could use it for better decision making and planning for investment in the financial market. The prediction power of the MPI could be enhanced to serve as a better forecasting tool for the financial market cycle in Bangladesh. In turn, the MPI could also provide more accurate insights for its users.

The aim of this study is to construct an MPI in Bangladeshi financial market. It will be used as a forecasting tool to forecast the financial stability for Bangladesh. In addition, MPI is an indicator which means that it could be used as a benchmark to evaluate the financial market movement or trend. In conjunction with this function, many parties will benefit from MPI such as the government, financial market players, listed organizations, traders and so on.

Methodology that will be used in this study is the dynamic hazard model in selecting the most suitable variables for the context of Bangladeshi financial system among the FSIs. The selected variables will then be compiled and further estimated, followed by their construction into MPI with multivariate model. The empirical finding of this study is suppose to have several implications. With this index, the stability of Bangladeshi financial system can be forecasted. The Government and related authorities are able to use this MPI as an alternative guideline in revising regulations and in tailoring policies. Other than that, MPI will also function as a benchmark for the financial market. This MPI that will be constructed might be able to keep track of the financial market trend in an inexpensive method. Hence, parties that are closely-related to the financial market such as speculators, traders and brokers could easily access the financial health in the past or present.

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